

I CLAIM:

1. In a PWM switching power output stage circuit, an over-current detection method comprising the steps of:
 - detecting the pulse width of the PWM signal;
 - detecting an over-current condition in the PWM circuit;
 - adaptively filtering a detected over-current condition relative to the pulse width; and
 - generating an over-current detection output.
2. A method according to claim 1 wherein the adaptively filtering step further comprises selecting a digital delay less than the pulse width of the PWM signal to ensure reliable detection.
3. A method according to claim 1 further comprising the step of providing a plurality of selectable digital delays for adaptively filtering the detected over-current condition.
4. A method according to claim 2 further comprising the step of providing at least one selectable digital delay of less than one half of a pre-selected minimum pulse width of the PWM circuit.
5. A method according to claim 1 wherein the outputting step further comprises outputting a positive over-current detection result for an over-current detection signal having a duration equal to or greater than the selected digital delay.

6. An over-current detection method for application in a PWM switching power output stage circuit , the over-current detection method comprising the steps of:
 - detecting the pulse width of a PWM signal in the PWM circuit;
 - selecting a digital delay less than the pulse width of the PWM signal;
 - detecting an over-current condition in the PWM circuit and providing an over-current detection signal;
 - filtering the over-current detection signal by means of the digital delay;
 - and
 - outputting an over-current detection result.
7. A method according to claim 6 further comprising the step of providing a plurality of selectable digital delays.
8. A method according to claim 6 further comprising the step of providing at least one selectable digital delay of less than one half of a pre-selected minimum pulse width of the PWM circuit.
9. A method according to claim 6 wherein the filtering step further comprises the step of logically determining that the over-current detection signal and the selected digital delay are both true.
10. A method according to claim 6 wherein the outputting step further comprises outputting a positive over-current detection result for an over-current detection signal having a duration equal to or greater than the selected digital delay.

11. An over-current detection method for PWM switching power stages, the over-current detection method comprising the steps of:

- providing a plurality of selectable digital delays, at least one selectable digital delay having a duration less than one half of a pre-selected minimum pulse width of the PWM circuit;

- detecting the pulse width of a PWM signal in the PWM circuit;

- selecting a digital delay less than the pulse width of the PWM signal;

- detecting an over-current condition in the PWM power stage and providing an over-current detection signal;

- filtering the over-current detection signal by means of logically determining whether the over-current detection signal and the selected delayed OC detection signal are both true; and

- outputting an over-current detection result for an over-current detection signal having a duration greater than the selected digital delay.

12. An over-current detection circuit for use in a PWM switching power stage, the over-current detection circuit comprising:

- a plurality of selectable digital delay paths;

- a pulse width detection circuit for detecting the pulse width of a PWM signal in the PWM system;

- an over-current condition detector for detecting the presence of an over-current in the PWM system;

- a filter for outputting an over-current detection result for an over-current detection signal having a duration equal to or greater than the selected digital delay.

13. An over-current detection circuit according to claim 12 further comprising at least one selectable digital delay path having a duration less than one half of a pre-selected minimum pulse width of the PWM circuit.

14. An over-current detection circuit according to claim 12 further comprising digital logic means for detecting the presence of an over-current detection signal having a duration greater than the selected digital delay.